126 Years of Pure and Wholesome Drinking Water

2001 Water Quality Report

Rochester Water & Lighting Bureau
10 Felix St., Rochester, N.Y. 14608

Public Water Supply ID # NY2704518

Rochester, NY All-America City 1998

ROCHESTER 2010 THE RENAISSANCE

City of Rochester, New York
William A. Johnson Jr., Mayor

Dear Water Customer,

I am pleased to present the Rochester Water and Lighting Bureau's Annual Water Quality Report. This report provides a descriptive overview of our water treatment and delivery system and a summary of water quality test data for 2001.

From our view, 2001 was a year of contrasts. We began the summer with a celebration of our water system's 125th anniversary. A review of our Bureau's history reminded our employees of how the trials and tribulations of living with contaminated wells and cisterns in Rochester in the mid 1800s led to development of the Hemlock water supply system, and how dramatically and quickly that new system improved city life. Then, in September, we were awakened to the stark realities of terrorism in the 21st century. We, like most other water suppliers throughout the country, have since been busy implementing new systems and procedures to help protect our drinking water from those who would do it harm. Some of our security efforts have been conspicuous, whereas others have not been publicized. Some, such as restricting public access to Cobbs Hill Reservoir, have even been somewhat controversial. As this story continues to unfold, our customers can be assured that our efforts will continue to focus on supplying you with a safe, wholesome supply of drinking water.

We hope this report will improve your understanding of Rochester's water supply system and the quality of water that flows from your tap. If you have further questions, comments or suggestions on how to improve future reports, please call us at ***367-3160.***

Donald Navor, Director of Water

Hemlock Gazebo

2001 Highlights

- **There was 100% compliance** with Federal and State drinking water regulations.
- **Our staff at Hemlock Filtration Plant received special recognition** through the USEPA's Partnership for Safe Water program for their dedication in optimizing water treatment processes.
- **Hemlock Lake water finished 2nd overall and 1st in the surface water category** in the annual New York State drinking water taste contest.
- **The Hemlock water supply system completed its 125th year of operation.** The anniversary was celebrated by several special public events held at the Bureau's Highland Park Upper Gatehouse during the annual Lilac Festival.
- **The tragic terrorist events of September focused increased attention on the security of the water system.** Security enhancements included installation of video surveillance systems and public access restrictions at water facilities.

Our Efforts to Make Your Water Safe to Drink Begin at the Source

For the past 126 years, Rochester has relied principally upon its upland watershed system (Hemlock and Canadice Lakes) for its drinking water supply. These lakes lie in the hills of Livingston and Ontario counties about 30 miles south of the city. The City's ownership of a large portion (20%) of the 60 square mile watershed, including the lakes and property surrounding the shorelines of both lakes, helps protect the quality of your drinking water. In addition, a variety of City initiatives help protect the lakes from potential sources of contamination on non-city-owned property in the watershed.

Each year, thousands of outdoor enthusiasts who visit the watershed gain a first-hand appreciation for this unique resource through activities such as hiking, fishing, hunting, and bird watching. If you wish to visit, please be aware that you will first need to obtain a free visitor permit, available on-site. You can learn more about watershed recreation, the permit system, and even download a permit at:

www.cityofrochester.gov/watershedpermit.htm

We also supply some City customers with Lake Ontario water purchased from the Monroe County Water Authority (MCWA). That water is treated at MCWA's Shoremont Filtration Plant near Lake Ontario on Dewey Avenue.

Always Use Water Wisely

Water remains an abundant, affordable commodity in our region. Despite this, City water demand has dropped substantially over the past 20 years, due to a number of factors. These include loss of water-dependent industry, decline in population, and a heightened focus on conservation. The following table presents some interesting comparative data for 1990 vs. 2001:

Statistics	1990	2001
Avg. Daily Production (MG)	36.8	34.5
Avg. Daily City Consumption (MG)	42.4	31.1
Avg. Daily Wholesale Sales (MG)	15.8	16.9
Avg. Daily Wholesale Purchase (MG)	20.8	13.2
Avg. Daily "Lost" Water (MG)	11.2	3.80
Cost ($/1000 for 1st 20,000gals)	1.52	2.14
Population Served	231,000	218,000
Number of Retail Accounts	63,052	61,408
(MG = million gallons)		

The City's comparatively low "lost water" rate is testimony to the Bureau's aggressive maintenance and repair programs. Lost-water is that portion of water input into the system that cannot be accounted for by metered sales and other permitted uses. The principal cause of lost-water is leakage. Some large eastern cities have lost-water rates approaching 50%.

Despite a local abundance of supply, it is important for citizens to recognize that conserving water helps conserve other resources as well, such as the electricity used to treat and pump both the water and the resulting waste stream. Here are some tips that will help save you money as well as conserve resources:

- **Fix leaky toilets and faucets promptly.** Replace old fixtures with newer, more efficient designs.
- **Water lawns and fill pools in the evening** or early AM hours when water losses are minimized and when the electrical supply is least stressed.
- **Don't let hoses or faucets run unattended.**

The Quality of Rochester's Drinking Water is Superior to Standards!

The sources of drinking water (both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and underground aquifers. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material. It can also pick up contaminants that result from the presence of animals and from human activities. These contaminants may include microbes (bacteria, viruses and protozoa), inorganic substances, pesticides, herbicides and other organic contaminants, and radioactive substances.

In order to ensure that tap water is safe to drink, the State and the United States Environmental Protection Agency (EPA) prescribe regulations that limit the amount of certain contaminants that can be present in water provided by public water systems as well as in bottled waters.

The roughly 50,000 tests performed on your drinking water last year showed that it was not only safe, but considerably better in quality than required by law.

Tests were performed for more than 80 biologic agents and chemical compounds that are regulated by the EPA. Tests were done on samples collected from all stages of the system, including the source (streams and lakes), different steps in the treatment process, the storage reservoirs, and from the customer's tap. The data tables on the opposite side of this brochure list results only for those substances that were detected. A complete list of all substances tested can be found on the **City website (cityofrochester.gov)** or obtained by calling our **Water Quality Laboratory at 367-3160.**

Please keep in mind that all drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. Also remember that some substances, such as chlorine and fluoride, are added to the water supply for health reasons. More information about contaminants and potential health effects can be obtained by calling the **EPA Safe Drinking Water Hotline at 1-800-426-4791.**

8944-0301TC

Treatment Processes Clean and Disinfect Your Water

The City's Hemlock Filtration Plant and MCWA's Shoremont Plant both employ a three-step treatment process. In the first step, chemicals called coagulants (primarily aluminum sulfate compounds) are added to the untreated water. This causes particles in the water (e.g., algae, bacteria, silt) to clump together into larger particles called "floc." In the second step, these floc particles are filtered out by passing the water through layered beds of sand and ground-up anthracite coal (granular activated charcoal is used at the MCWA plant). In the final step, chlorine is carefully added to disinfect the water and keep it free of harmful microorganisms. Fluoride is also added to help prevent tooth decay. Hemlock water is also seasonally adjusted for pH.

During 2001, both the City and MCWA treatment plants produced drinking water that was considerably better in quality than the health regulations required. One example was the turbidity (clarity) of filtered water. Whereas, health standards required that treated water turbidity be less than 0.5 units 95 percent of the time, the turbidity of water produced at both treatment plants was less than 0.16 units 100 percent of the time.

Our Focus on Quality is Maintained Until the Water Flows From Your Tap

Water treated at the Hemlock Filtration plant flows north to the city by gravity. Along the way, water is sold (wholesale) to the Livonia, Lima, and North Bloomfield water districts. It is also sold to MCWA, who in turn supplies it to several Monroe County communities, including Honeoye Falls /Mendon, Rush, Henrietta, and Brighton.

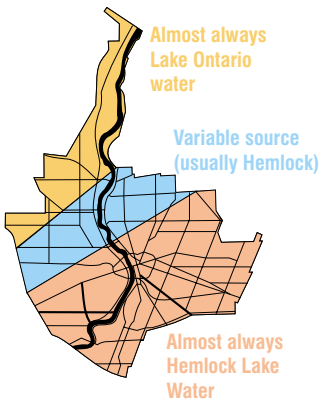
The average age of the three large pipelines that deliver Hemlock water to the City is nearly 100 years. Planned investments in maintenance and upgrades are expected to extend the service life of these pipes another 75 years. The most recently completed upgrade involved replacing a critical 4100-foot segment of 36-inch pipe that joins the three conduits near the northern boundary of Livingston County.

Water transmitted from Hemlock Lake to the City is stored in three large, open reservoirs located in the Town of Rush (63 MG), at Cobbs Hill (144 MG), and in Highland Park (26 MG). Water is re-disinfected with chlorine as it exits each reservoir to help protect against any contaminants that may have been introduced during storage. During the summer, reservoirs are treated periodically for algae growth in order to maintain clarity and keep it free of objectionable flavors. Recently completed reservoir improvements included the remodeling of the disinfection system at the Rush Reservoir, and installation of improved security and surveillance systems at all three reservoirs.

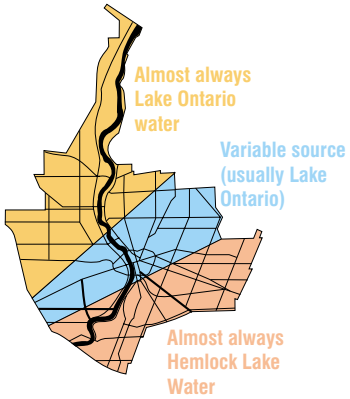
Lake Ontario water, purchased from MCWA, is introduced to the City in the area of Mt. Read Blvd. and Ridge Road. The volume of daily purchase varies considerably, ranging from 25 to 30 million gallons per day (MGD) during certain summer days when customer demand is high, to less than 2 MGD during much of the winter. This variability means that some areas of the City may receive either Hemlock or Ontario water or, a mixture, depending on the season and the prevailing level of demand. Droughts, such as the one that persisted at Hemlock Lake throughout 2001, can also be a factor in determining how the two sources of supplies are utilized. The maps below show the typical distribution patterns of the two sources of supply during typical summer and winter conditions.

After the water enters the City's water mains, or "distribution grid," it falls under the custody of the City Water Bureau staff who work to maintain and improve the complex system of piping (599 miles), water meters (61,649), and hydrants (7254). In 2001, nearly four million dollars were spent to upgrade the water distribution network. Improvements included cleaning and lining of pipe, pipe replacement, and replacement of meters and hydrants.

Winter Distribution Pattern



Summer Distribution Pattern



Detected Levels of All Substances Were Well Below Allowed Limits

The test results in these tables are mostly for regulated substances that were detected in the water. The "non-detect" results for the dozens of others tests performed are not included herein because of space constraints. A complete list of results for all substances tested in 2001 is available by doing a search for water quality on the City's website **(www.cityofrochester.gov),** or by calling our **Water Quality Laboratory at 367-3160.**

Inorganics and Radiologicals

The following substances were detected in water collected at the treatment plant or from the water distribution system (customer tap). Not all of these substances are harmful, and in fact, some are purposely added during the treatment process for health benefit. The substances that are regulated because of health concerns are printed in bold. Data are also included for certain unregulated substances that are often of interest.

Substance	units	MCLG	MCL	Hemlock Average (range)	Ontario Average (range)	Tested at	Likely source	Meets EPA Standards
Arsenic	µg/L	NA	10	ND	ND–1.6	WTP	Erosion of natural deposits	YES
Barium	mg/L	2	2	0.017	(.019–.029)	WTP	Erosion of natural deposits	YES
Chlorine (entry point)	mg/L	NA	4	0.9 (0.6–1.4)	1.23 (0.84–1.7)	WTP	Disinfectant additive	YES
Chlorine (at-the-tap)	mg/L	NA	NA	0.5 (0–1.2)	NA	DS	Disinfectant additive	YES
Chromium	µg/L	100	100	1.2	ND	WTP	Natural deposits; industrial waste	YES
Fluoride	mg/L	NA	2.2	0.89 (0.65–1.22)	1.01 (0.25–1.18)	WTP	Water treatment additive to promote dental health	YES
Gross Beta	pCi/L	0	50	2.9 (±2.5)	ND	WTP	Erosion of natural deposits	YES
Nickel	µg/L	NA	100	1.4	ND	WTP	Natural mineral; industrial waste	YES
Nitrate	mg/L	10	10	ND–0.24	ND–0.5	WTP	Fertilizers; erosion of natural deposits; septic tank leachate	YES
Chloride	mg/L	NA	250	(25–26)	(21–25)	WTP	Natural deposits; road salt	YES
Color	Color Units	NA	15	2.5–5	ND–3	WTP	Naturally occuring	YES
Hardness (as $CaCO_3$)	mg/L grains	NA	NA	84 (5)		WTP	Erosion of natural mineral deposits	YES
Sodium	mg/L	NA	NA	14	12	WTP	Natural deposits, road salt, water treatment chemical component	YES
Sulfate	mg/L	NA	250	19–21	25–31	WTP	Natural deposits	YES
Zinc	mg/L	NA	5	0.0015	ND	WTP	Naturally occuring	YES

Copper and Lead

Neither copper nor lead are found in meaningful levels in Hemlock Lake or Lake Ontario water. However, minute quantities of these substances can become dissolved in the water as it passes through plumbing if the pipes and/or plumbing fixtures contain these metals. Past testing has shown that this is not a significant problem in Rochester, since typical at-the-tap levels of copper and lead run well below allowed limits. Regulatory authorities have consequently allowed Rochester to reduce its testing schedule for lead and copper.

Substance	units	Regulatory Goal (ALG)	Regulatory Limit (AL)	Distribution Households		Likely source	Meets EPA Standards
				90% of samples had levels less than	% of samples Above AL		
Copper	mg/L	1.3	1.3	0.18	0	Corrosion of pipes and plumbing fixtures	YES
Lead	µg/L	0	15	6	0	Corrosion of pipes and plumbing fixtures	YES

Turbidity

This is a measure of the clarity of water and it is a key parameter for judging the effectiveness of water filtration. Regulatory compliance is based on "entry point" samples taken at the water treatment plant.

Substance	units	Regulatory limit	Hemlock Plant		Shoremont Plant		Likely source	Meets EPA Standards
			Average (maximum)	Compliance w/standard	Average (maximum)	Compliance w/standard		
Turbidity (entry point)	NTU	TT=95% of samples must be < 0.5 NTU	0.09 (0.16)	100%	0.07 (.02–.14)	100%	Erosion of soils through runoff, algae	YES
Turbidity (at-the-tap)	NTU	Avg.< 5 NTU	0.16 (2.8)	NA	NA	NA	Algae, corrosion of pipes	YES

Bacteria and Protozoa

Bacteria testing was done on approximately 200 samples collected each month from many locations throughout the city. The primary test was for Total Coliform bacteria, a group of bacteria used to indicate the general sanitary conditions in a water system. Most species of this group do not present a health concern. However, the species *E. coli* can be pathogenic and its confirmed presence is taken seriously. In 1993, the State Health Department granted the City a "biofilm variance," or exception to the Total Coliform MCL. Biofilm is a layer of bacteria that can be found on almost all surfaces, including the inside walls of water pipes. A biofilm variance is only granted where it is shown through testing that the species of coliform bacteria recovered from the water system are harmless environmental strains originating from the pipeline biofilm. The variance does not apply to *E. coli,* or any situation where there is evidence of some external source of contamination. *Cryptosporidium* and *Giardia* are pathogenic protozoans that can cause a form of gastro-intestinal illness that can be a serious health concern for some persons with weak or damaged immune systems (such as AIDS patients).

Organism	units	MCLG	MCL	HEMLOCK SUPPLY Highest presence (average presence)	ONTARIO SUPPLY Highest presence (average presence)	Likely source	Meets EPA Standards
Total Coliform bacteria	% monthly Presence	0	Violation if present in more than 5% of monthly samples	1.2 (0.3)		Naturally present in soils and in wastes of warm blooded animals	YES
E. coli bacteria	presence	0	Violation upon any confirmed presence	No confirmed presence	No confirmed presence	Wastes of warm blooded animals & humans	YES
Cryptosporidium	# / 100 L	NS	NS	Not Detected	Not Detected	Wastes of infected animals & humans	YES
Giardia sp	# / 100 L	NS	NS	Not Detected	Not Detected	Wastes of infected animals & humans	YES

Organic Compounds

Organic, or carbon-containing compounds, can be simple or very complex in form. They can be found in water in many natural forms, as well as residues of a wide array of man-made (synthetic) chemicals such as pesticides, solvents, and petroleum products. Thanks to the high quality of our source waters, the levels of most synthetic organic substances in Rochester's drinking water are too low to measure. However, several organic compounds known as disinfection byproducts (DBP's) are commonly found at low levels. DBP's form when natural organic substances react with the disinfectants added during water treatment. Health regulations limit the levels of many synthetic and DBP compounds that can be present in your water. A complete list of test results for organic contaminants can be found on the City website **(www.cityofrochester.gov).**

Substance	units	MCLG	MCL	Hemlock Average (range)	Ontario Average (range)	Likely source	Meets EPA Standards
Total Trihalomethane	µg/L	NS	80	38 (9–51)	34 (12–54)	Byproduct of water chlorination	YES
Haloacetic acids	µg/L	NS	60	33 (5–55)	11 (2–22)	Byproduct of water chlorination	YES
Haloacetonitriles*	µg/L	NS	50	3.9 (1.5–5.3)	4.4 (3.4–5.5)	Byproduct of water chlorination	YES
Haloketones*	µg/L	NS	50	4.5 (1.2–7.6)	1.8 (0.9–3.4)	Byproduct of water chlorination	YES
Chloropicrin*	µg/L	NS	NS	0.5 (ND–0.8)	ND	Byproduct of water chlorination	YES
Chloral hydrate*	µg/L	NS	NS	8.5 (1.6–13)	4.6 (1.6–12)	Byproduct of water chlorination	YES
Total Organic Halides*	µg/L	NS	NS	245 (110–350)	101 (54–158)	Byproduct of water chlorination	YES

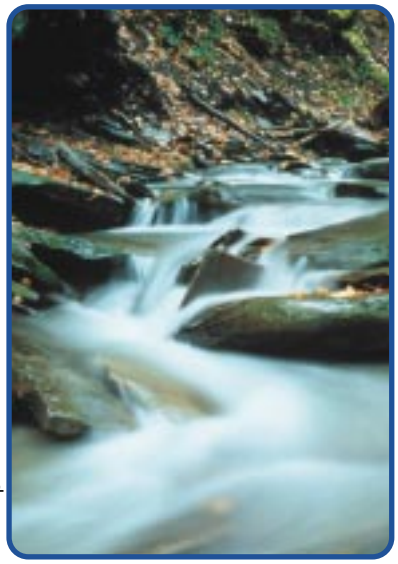


photo credit: Liana Schuetz

Answers to Common Questions

Why is bottled water so popular?

Customers choose to drink bottled water, or to further treat their tap water with what are known as point-of-use devices, for different reasons. Although this is a matter of personal choice, customers should be aware that these other options are not necessarily safer than tap water. For example, studies have shown that certain point-of-use filters, if not maintained properly, can produce water of significantly poorer quality than that which flows from your tap. Some bottled waters have been shown to contain surprisingly high levels of certain contaminants.

Is tap water safe for everyone?

Generally yes, but there are some people who may wish to take special precautions. They include immunocompromised persons such as those with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune disorders, infirm elderly, and infants. These people should seek advice from their health care provider about their drinking water. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium, Giardia,* and other microbial pathogens are available from the **EPA Safe Drinking Water Hotline (1-800-426-4791).**

Is there lead in my drinking water?

Lead is not present in most source waters, including Hemlock Lake and Lake Ontario. However, minute quantities of lead can dissolve into your tap water if it has been in prolonged contact with lead-bearing pipes and plumbing fixtures. Our customers can take comfort in knowing that our ongoing studies have shown that at-the-tap lead levels in the vast majority of Rochester households are well below the allowed limit. In fact, levels have been steadily declining since the Hemlock Filration Plant was placed into service in 1993, and in recent years have been so low that health authorities have permitted the City to reduce its testing frequency. Customers should note that they can further minimize their lead intake from water by simply allowing the tap to run for two minutes whenever the water has been stagnant in your pipes for several hours.

Water pipeline construction. ca. 1900

Why does my water sometimes taste like chlorine?

Health regulations require water suppliers to add chlorine to drinking water to help protect against dangerous microorganisms. It is widely accepted that the undesirable aspects of chlorination (e.g., formation of byproducts, taste) are greatly outweighed by the benefits of its use. Since its widespread adoption in the early 1900s, chlorine has virtually eliminated outbreaks of waterborne diseases such as cholera and typhoid fever throughout the U.S. and Canada. Chlorine levels are carefully controlled to ensure compliance with the regulations. If you find the chlorine taste unpleasant, try filling a container with water and keeping it loosely capped in the refrigerator. The chlorine flavor will dissipate within a few hours.

Sometimes the water coming out of the tap is reddish/yellow or brown. Why?

This is usually an indication of iron or "rust" in the water. Iron is not harmful, but it can stain laundry and impart a metallic taste. If yours is the only home on your street experiencing this problem, it may be a sign that the water line running from the street to the house, or even your own household pipes or water heater, are rusting. If the problem is also being experienced by neighbors, it may indicate that there is poor circulation in nearby water mains. Call our laboratory at **367-3160** for assistance if this problem persists.

Would you like more information?

For more information about water quality, or to schedule tours of treatment or reservoir facilities, call the **Hemlock Lake Treatment Plant at 367-3160.** For water billing questions or other service-related issues, call the **Department of Environmental Services 24-hour Office of Customer Satisfaction, 428-5990.** You can also find more water quality test data and information on Rochester's water system by doing a search for Hemlock on the City website: **www.cityofrochester.gov**

To find out more about New York State health regulations and/or local water quality issues, contact the **Monroe County Department of Health at 274-6057.**

To view the Water Quality Report of the **Monroe County Water Authority,** log on to: **www.MCWA.com**

To find out more about water quality and Federal regulations, call the **EPA Hotline at 1-800-426-4791,** or log on to the following **EPA website: www.epa.gov/ogwdw/**

To find out more about Cryptosporidium and other waterborne diseases, log on to **Center for Disease Control website at: www.cdc.gov/ncidod/diseases/crypto/sources.htm**

To find out more about point-of-use water treatment devices, log on to the **National Sanitation Foundation website at: www.nsf.com/consumer/consumerinfo.htm**

Definitions of terms

The following definitions apply to the terms used in the water quality data tables.

MCL *maximum contaminant level* - highest level of a contaminant allowable in drinking water. MCLs are set as close to the MCLGs as feasible.

MCLG *maximum contaminant level goal* - the level of a contaminant in drinking water below which there is no known or expected health risk, with allowance for a margin of safety.

AL *action level* - the concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow. There are special treatment requirements if lead levels are not below 15 µg/L at 90% or more of sites tested.

ALG *action limit goal* - the level of a contaminant in water below which there is no known or expected health risk, with allowance for a margin of safety.

At-the-tap - distribution system sampling location(s) such as a customer's household tap

DS *distribution system* - the grid of water pipes that line city streets

Entry point - point at which water is introduced to the system following treatment. Identified for regulatory compliance purposes.

TT *treatment technique* - a required process intended to reduce the level of a contaminant in drinking water.

L *liter* - volume of water slightly larger than a quart

mg/L *milligrams per liter* - same as parts per million (PPM); corresponds to one ounce in 7812.5 gallons of water

µg/L *micrograms per liter* - same as parts per billion (PPB); corresponds to one ounce in 7,812,500 gallons of water.

ND *not detected* - laboratory analysis indicates that the constituent is not present.

NS *no standard* - no regulatory standard in effect.

NA *not applicable*

NTU *nephelometric turbidity unit* - a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

pCi/L *picocuries per liter* - A measure of the radioactivity of water.

WTP *water treatment plant*